

**CLAIMS**

What is claimed is:

1. A flow control device for controlling the flow rate  
5 through tubing placed in an oil well, the tubing including  
at least one hole therethrough, the device comprising:
  - a closure sleeve adapted to slide over the tubing  
hole, the closure sleeve having a front edge  
having a wave-like surface;
  - 10 one or more seals mounted downstream of the tubing  
hole, the one or more seals cooperating in a  
fluid-tight manner with the closure sleeve;
  - a protective sleeve mounted in alignment with the  
closure sleeve and proximate to the one or  
15 more seals, the protective sleeve having a  
top edge adapted for mating engagement with  
the wave-like surface of the front edge of  
the closure sleeve; and
  - a return mechanism for automatically returning the  
20 protective sleeve to a covering position in  
which the protective sleeve covers the first  
seal when the first seal is not covered by  
the closure sleeve.

2. A device according to claim 1, wherein the return mechanism comprises a spring interposed between the tubing and the protective sleeve.

3. A device according to claim 2, wherein the closure sleeve is mounted on the outside of the tubing; and the spring is mounted on the outside of the tubing between the protective sleeve and a shoulder defined on the tubing.

4. A device according to claim 3, wherein a cover is placed around the spring.

5. A device according to claim 4, wherein the protective sleeve, the spring, and the cover form an assembly adapted to be mounted as a single unit on the tubing.

6. A device according to claim 1, wherein the protective sleeve is in abutment against an abutment surface of the tubing when the protective sleeve is in the covering position.

7. A device according to claim 1, wherein the closure sleeve is adapted to move between a closure position, in which the closure sleeve covers the one or more seals, and a controlled opening position, in which a front edge of the

closure sleeve cooperates with the tubing hole to form a through hole of variable section.

8. A device according to claim 7, wherein: the protective sleeve occupies the covering position as long as  
5 the closure sleeve occupies the controlled opening position; the front edge of the closure sleeve is adapted to engage a top edge of the protective sleeve while the closure sleeve is moving towards its closure position; so that the one or more seals are always covered fully by at least one of the  
10 closure sleeve and the protective sleeve.

9. A device according to claim 1, wherein the closure sleeve is mounted on an outer surface of the tubing.

10. A flow control device for controlling the flow rate through tubing placed in an oil well, the tubing including  
15 at least one hole therethrough, the device comprising:  
a closure sleeve adapted to slide over the tubing hole;  
one or more seals mounted downstream of the tubing hole, the one or more seals cooperating in a  
20 fluid-tight manner with the closure sleeve, the one or more seals having a wave-like geometry;

a protective sleeve mounted in alignment with the  
closure sleeve and proximate to the one or  
more seals; and

5 a return mechanism for automatically returning the  
protective sleeve to a covering position in  
which the protective sleeve covers the one or  
more seals when the one or more seals are not  
covered by the closure sleeve.

11. A device according to claim 10, wherein the return  
10 mechanism comprises a spring interposed between the tubing  
and the protective sleeve.

12. A device according to claim 11, wherein the closure  
sleeve is mounted on the outside of the tubing; and the  
spring is mounted on the outside of the tubing between the  
15 protective sleeve and a shoulder defined on the tubing.

13. A device according to claim 12, wherein a cover is  
placed around the spring.

14. A device according to claim 13, wherein the  
protective sleeve, the spring, and the cover form an  
20 assembly adapted to be mounted as a single unit on the  
tubing.

15. A device according to claim 10, wherein the protective sleeve is in abutment against an abutment surface of the tubing when the protective sleeve is in the covering position.

5        16. A device according to claim 10, wherein the closure sleeve is adapted to move between a closure position, in which the closure sleeve covers the one or more seals, and a controlled opening position, in which a front edge of the closure sleeve cooperates with the tubing hole to form a  
10 through hole of variable section.

17. A device according to claim 16, wherein: the protective sleeve occupies the covering position as long as the closure sleeve occupies the controlled opening position; the front edge of the closure sleeve is adapted to engage a  
15 top edge of the protective sleeve while the closure sleeve is moving towards its closure position; so that the one or more seals are always covered fully by at least one of the closure sleeve and the protective sleeve.

18. A device according to claim 10, wherein the closure  
20 sleeve is mounted on an outer surface of the tubing.

19. A well completion, comprising:

a tubing including at least one hole therethrough;

a closure sleeve adapted to slide over the tubing hole, the closure sleeve having a wave-like front edge;

5 one or more seals mounted on the tubing downhole of the tubing hole, the one or more seals cooperating in a fluid-tight manner with the closure sleeve;

10 a protective sleeve mounted in alignment with the closure sleeve and proximate to the one or more seals, the protective sleeve having a top edge adapted for mating engagement with the front edge of the closure sleeve; and

15 a return mechanism for automatically returning the protective sleeve to a covering position in which the protective sleeve covers the one or more seals when the one or more seals are not covered by the closure sleeve.

20. A well completion, comprising:

20 a tubing including at least one hole therethrough; a closure sleeve adapted to slide over the tubing hole;

one or more seals mounted on the tubing downhole of the tubing hole, the one or more seals cooperating in a fluid-tight manner with the

closure sleeve, the one or more seals having  
a wave-like geometry;

a protective sleeve mounted in alignment with the  
closure sleeve and proximate to one or more  
5 seals; and

a return mechanism for automatically returning the  
protective sleeve to a covering position in  
which the protective sleeve covers the one or  
more seals when the one or more seals are not  
10 covered by the closure sleeve.